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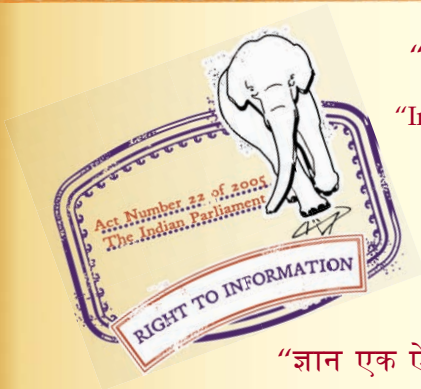
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“Step Out From the Old to the New”

IS 4053 (1967): Knitted Puttees, Dyed [TXD 10: Hosiery]



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Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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IS : 4053 - 1967

(Reaffirmed 1993)

Indian Standard

REAFFIRMED

SPECIFICATION FOR KNITTED PUTTEES, DYED

2003

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UDC 687.394 (Puttee)

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**BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002**

Gr 3

June 1967

Indian Standard

SPECIFICATION FOR KNITTED PUTTEES, DYED

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Indian Standard

SPECIFICATION FOR KNITTED PUTTEES, DYED

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 31 March 1967, after the draft finalized by the Hosiery Sectional Committee had been approved by the Textile Division Council.

0.2 Puttee is a cloth strip used as a kind of gaiter or legging for wrapping around the ankle and the leg by soldiers, riders, etc. Puttees which are rendered water-repellant are used in snow-covered regions.

0.3 This standard is based on IND/TC/4461(a) 'Specification for puttees, service dress' issued by the Ministry of Defence, Government of India.

0.4 This standard contains clauses which call for agreement between the buyer and the seller. Such clauses are 3.1 to 3.3, 4.3.1, 6.4 (j), 7.3 and Item (v) of Table 2.

0.5 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard prescribes the constructional details and other particulars of knitted puttees, dyed.

1.2 This standard does not prescribe general appearance, colour, type of finish, feel, etc, of puttees (*see also* 4.3).

2. TERMINOLOGY

2.1 For the purpose of this standard, the definitions as given in IS : 3596† shall apply.

*Rules for rounding off numerical values (*revised*).

†Glossary of terms relating to hosiery (*under preparation*)

3. GENERAL REQUIREMENTS

3.1 Yarn — Two worsted yarns of approximately 44 tex (20s worsted count) for knitting and one woollen yarn of approximately 160 tex (12s Yorkshire woollen count*) for laying-in, shall be used for making the basic material for puttees. They shall be spun from not lower than 50s quality wool or 50s quality wool blended with man-made fibres in proportions as agreed to between the buyer and the seller [see Item (v) of Table 2].

3.2 Knitted Fabric — Dyed yarns of the required shade shall be used in knitting the puttees. The knitted fabric shall be milled to achieve the required degree of cover and firmness and shall be rendered moth-proof, and water-repellant if agreed to between the buyer and the seller.

3.3 Cotton Tape — Cotton tape in the puttee shall be of the best trade quality as agreed to between the buyer and the seller. The tape shall be dyed to the shade as that of the puttee. The free end of the tape shall be turned in to a depth of 0.5 cm and stitched securely (see Fig. 1) or cut to a serrated edge or shallow-tail shape to avoid fraying of the cut edge.

3.4 Stitching

3.4.1 All sewings shall be done with lock stitches.

3.4.2 For all stitches, cotton sewing thread of approximately 25 tex \times 3 (cotton count 24s/3) or 9.8 tex \times 6 (cotton count 60s/6), preferably conforming to Variety No. 6 or 16 respectively of IS : 1720-1960†, shall be used. It shall be of the same colour as that of the puttee.

3.4.3 In shape the puttees shall be generally as shown in Fig. 1.

3.4.4 The puttees shall be tailored neatly out of the knitted fabric (see 3.2) and cotton tape (see 3.3). The wales shall run along the length of the puttees.

4. SPECIFIC REQUIREMENTS

4.1 Varieties — The puttees shall be of 3 varieties, as prescribed in Table 1. The dimensions and weight of puttee shall conform to the relevant requirements of Table 1, when read with Fig. 1.

4.2 Other Requirements — Puttees shall conform to the other requirements given in Table 2.

*Woollen Yorkshire = Number of 256 yd skeins in a pound. To convert woollen Yorkshire to tex, divide 1 938 by the 'woollen Yorkshire count'.

†Specification for cotton sewing thread, bleached or dyed.

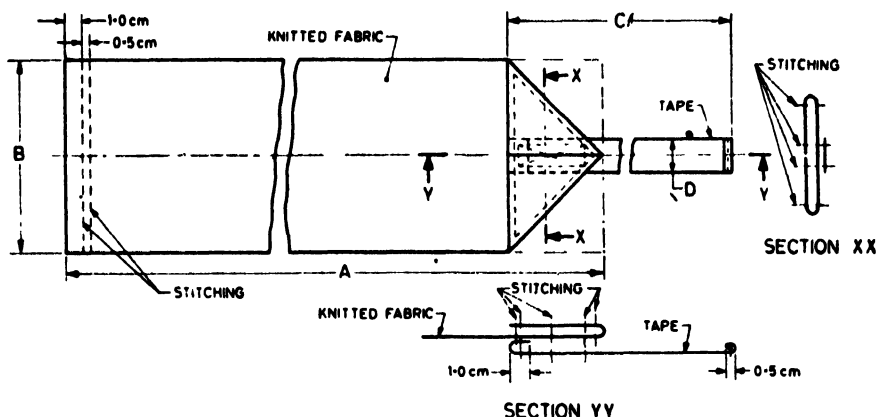


FIG. 1 A TYPICAL PUTTEE (WITH TAPE EDGE STITCHED)

TABLE 1 DIMENSIONS AND WEIGHT OF PUTTEES

(Clause 4.1, and Fig. 1)

VARIETY	DIMENSIONS*				WEIGHT PER 10 PAIRS OF PUTTEES† Min kg
	A	B	C	D	
(1)	(2)	(3)	(4)	(5)	(6)
	cm	cm	cm	cm	kg
P ₁	100	11.5	115	2.0	1.560
P ₂	275	11.5	150	2.0	4.250
P ₃	325	11.5	150	2.0	5.125
TOLERANCE	±3	±0.5	±3	±0.3	—

*To be determined by the method prescribed in IS:1954-1961 Methods for determination of dimensions of fabrics.

†To be determined by the method prescribed in A-3.

4.3 Sealed Sample— If, in order to illustrate or specify the general appearance, colour, type of finish, feel, etc, of puttees, a sample has been agreed upon and sealed, the supply shall be in conformity with the sample in such respects.

4.3.1 The custody of the sealed sample shall be a matter of prior agreement between the buyer and the seller.

TABLE 2 OTHER REQUIREMENTS OF PUTTEES

(Clause 4.2)

SL No.	CHARACTERISTIC	REQUIREMENT	METHOD OF TEST (REF TO IS OR CLAUSE NO. OF APPENDIX A)
(1)	(2)	(3)	(4)
i)	a) Breaking load of fabric (full width \times 20 cm) b) Elongation of fabric at the time of rupture	50 kg, <i>Min</i> 30 percent, <i>Min</i>	} IS : 1969-1981*
ii)	Water absorption [for puttees rendered water-repellant (see Note)]	75 percent, <i>Max</i>	
iii)	Moth-proofing with dieldrin	0.03 percent (on dry weight), <i>Min</i>	A-5
	<i>or</i> Dichlor diphenyl trichlorethane (DDT)	0.3 percent (on dry weight), <i>Min</i>	Appendix B of IS : 1719-1961†
iv)	Colour fastness to a) artificial light b) washing c) rubbing d) perspiration	4 or better 4 or better 4 or better 3 or better	IS : 2454‡ IS : 687-1966§ IS : 706-1956 IS : 971-1956¶
v)	Composition and proportion of fibres in puttees (for puttees made of wool blended with man-made fibres)	As agreed to between the buyer and the seller	IS : 2006-1962**

NOTE — If agreed to between the buyer and the seller, the puttees shall be rendered water-repellant also.

*Method for determination of breaking load and elongation at break of woven fabric (by constant-rate-of-traverse machine).

†Specification for felts, woollen, proofed and unproofed.

‡Method for determination of colour fastness of textile materials to artificial light (under preparation).

§Method for determination of colour fastness of textile materials to washing, Test 1 (first revision).

¶Method for determination of colour fastness of textile materials to rubbing.

||Method for determination of colour fastness of textile materials to perspiration.

**Method for quantitative chemical analysis of binary mixtures of protein fibres and certain other fibres.

5. MARKING

5.1 A cloth label of suitable size shall be securely stitched to each puttee near the end of the tape on which shall be indicated the following:

- a) Variety of puttee (such as P_1 , P_2 , or P_3);
- b) Manufacturer's name, initials or trade-mark, if any;
- c) The letters 'MP', if moth-proofed; and
- d) Any other information required by the buyer.

5.1.1 The product may also be marked with Standard mark.

5.1.2 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

6. PACKING

6.1 Make a bundle of 10 pairs of puttees and wrap them in kraft paper conforming to the requirements of Grade 2 of IS:1397-1960*. Tie the boundle with cotton or jute twine of suitable quality at least at two places to make a bundle.

6.2 Place the required number of bundles as prepared in 6.1 on the table of a baling press over layers of packing materials listed below:

- a) Polyethylene film of at least 40 microns thickness conforming to the requirements of Grade 123 of IS:2508-1963†.

or

the waxed paper, and

- b) Heavy cee cloth conforming to the requirements of IS:3751-1966‡.

Place similar layers of packing materials over the top of the arranged bundles. The packing materials shall be in sound, clean and dry condition and shall be of sufficient size to cover the bundles with adequate overlaps on all sides.

*Specification for kraft paper.

†Specification for low density polyethylene films.

‡Specification for heavy cee cloth.

6.2.1 The gross weight of the bale shall not exceed 35 kg.

6.3 Press the bale to make it sufficiently rigid so that it does not itself sag nor its contents slip.

6.3.1 When the bale is still under pressure, sew heavy cloth with 3-ply double jute twine of adequate strength taking care not to pierce the inner wrapping during sewing. Bind the bale at right angles to its length and width with flat steel strips (or hoops).

NOTE — Puttees of same variety should be packed in one bale.

6.4 Each bale shall be marked with the following information leaving adequate space for marking by railways or postal authorities:

- a) Material;
- b) Variety packed (for example, P₁, P₂ or P₃);
- c) Number of pairs packed in a bale;
- d) Gross weight of bale in kg;
- e) Year of manufacture;
- f) The letters 'MP', if moth-proofed;
- g) Manufacturer's name, initials or trade-mark, if any;
- h) Name and address of the consignee; and
- j) Any other information required by the buyer or by the law in force.

7. SAMPLING

7.0 The sampling procedure given below shall give desired protection to the buyer and the seller provided the lot submitted for inspection is homogeneous. To achieve this, the manufacturer shall maintain system of process control at all stages of manufacture ensuring that puttees tendered by him for inspection comply with the requirements of this standard in all respects.

NOTE — For effective process control, the use of statistical quality control techniques is recommended and helpful guidance may be obtained in this respect from IS : 397-1952*.

7.1 Lot — All the puttees of the same variety, colour and treated similarly for moth-proofing, delivered to a buyer against one despatch note shall constitute a lot.

7.2 Each lot shall be tested separately to ascertain its conformity with the requirements of this standard.

7.3 Unless otherwise agreed to between the buyer and the seller the number of bundles to be selected from a lot shall be in accordance with col 2 of Table 3.

*Method for statistical quality control during production by the use of control chart (tentative).

TABLE 3 SAMPLE SIZE AND CRITERIA FOR CONFORMITY*(Clauses 7.3, 7.5 and 7.6)*

NO. OF BUNDLES IN A LOT	NO. OF BUN- DLES TO BE SELECTED	NON-DESTRUCTIVE TESTING		NO. OF PAIRS OF PUTTEES TO BE SELEC- TED FOR DES- TRUCTIVE TESTING
		No. of Pairs of Puttees to be Selected	Permissible No. of Non- conforming Puttees	
(1)	(2)	(3)	(4)	(5)
Up to 25	3	6	1	5
26 „ 100	5	10	2	5
101 „ 150	8	16	3	10
151 „ 300	13	26	5	10
301 and above	20	40	7	10

7.4 For the purpose of determining the weight, all the 10 pairs of puttees in each of the bundles, selected according to 7.3 shall constitute the test specimen.

7.5 For determining dimensions, the number of pairs of puttees specified in col 3 of Table 3 shall be selected at random from the bundles selected in 7.3. Each puttee so selected shall constitute the test specimen.

7.6 For determining breaking load and elongation, water absorption, and colour fastness, the number of pairs of puttees specified in col 5 of Table 3 shall be selected at random from those tested for dimensions (see 7.5). All the pairs so selected shall constitute the test sample.

7.6.1 For the purpose of determining

- a) dieldrin or DDT, and
- b) composition and proportion of fibres in puttees (for puttees made of wool blended with man-made fibres)

at least two composite specimens shall be tested.

7.7 Criteria for Conformity — A lot shall be considered as conforming to this standard if the following conditions are satisfied:

- a) In respect of weight, each of the observed values satisfies the requirements specified in Table 1.
- b) In respect of dimensions, the number of puttees failing to satisfy the requirements of Table 1 does not exceed the applicable number specified in col 4 of Table 3.
- c) In respect of requirements enumerated in 7.6, each of the observed values satisfies the relevant requirement of Table 2.

APPENDIX A

(Tables 1 and 2)

METHODS OF TEST

A-1. CONDITIONING OF TEST SPECIMENS AND ATMOSPHERIC CONDITIONS FOR TESTING

A-1.1 Conditioning — Prior to test, the test specimens shall preferably be conditioned to moisture equilibrium in a standard atmosphere at 65 ± 2 percent relative humidity and $27^\circ \pm 2^\circ\text{C}$ temperature (*see also IS : 196-1966**).

A-1.1.1 When the test specimens have been left in such an atmosphere for 24 hours in such a way as to expose, as far as possible, portions of the specimens to the atmosphere, they shall be deemed to have reached moisture equilibrium.

A-1.2 Atmospheric Conditions for Testing — The test shall preferably be carried out in the standard atmospheric conditions (*see A-1.1*).

A-2. QUALITY OF REAGENTS

A-2.1 Unless specified otherwise pure chemicals shall be employed in test and distilled water (*see IS : 1070-1960†*) shall be used where the use of water or distilled water as a reagent is intended.

NOTE — 'Pure chemicals' mean chemicals that do not contain impurities which affect the test results.

A-3. WEIGHT

A-3.1 Take each test specimen constituting 10 pairs of puttees (*see 7.4*). Condition them to moisture equilibrium in a standard atmosphere (*see A-1.1*) and determine the collective weight of all the 10 pairs of puttees.

A-4. WATER ABSORPTION

A-4.1 Test Specimens — Cut 3 pieces measuring 10×10 cm from different places of a puttee from the test sample (*see 7.6*) so that they represent the puttee as fully as possible. Each piece shall constitute a test specimen.

A-4.2 Condition the test specimen (*see A-1.1*). Weigh each test specimen in an air-tight container.

A-4.3 Place each specimen gently on the surface of water maintained at 40°C temperature in a shallow tray. Keep the specimen floating on the surface of the water.

*Atmospheric conditions for testing (*revised*).

†Specification for water, distilled quality (*revised*).

A-4.4 At the end of half an hour, if the specimen still floats on the surface (*see* Note) remove the test specimen from the tray. Remove excess of water adhered loosely on the surface by pressing it against a blotting paper.

NOTE — If the specimen sinks in the water, it shall be held to have failed the test.

A-4.5 Weigh each test specimen in an air-tight container and calculate percentage of water held by the following formula:

$$A = \frac{100 \times W_2}{W_1}$$

where

A = percentage of water absorbed,
 W_2 = weight in grams of water absorbed, and
 W_1 = original weight in grams of the test specimen.

A-4.5.1 Similarly calculate the percentage of water absorbed by each of the remaining two specimens cut from a puttee. Calculate the mean of the three values.

A-5. ESTIMATION OF DIELDRIN

A-5.1 Reagents

A-5.1.1 Benzene — free from thiophene and chlorine.

A-5.1.2 Isopropyl Alcohol — of two concentrations, one 99 percent and the other 50 percent (v/v).

A-5.1.3 Metallic Sodium — pure, in the form of ribbon or cut in small pieces.

A-5.1.4 Methyl Alcohol

A-5.1.5 Phenolphthalein Indicator Solution — 1 percent (w/v) in rectified spirit (conforming to IS : 323-1959*).

A-5.1.6 Dilute Nitric Acid — 50 percent (v/v).

A-5.1.7 Standard Silver Nitrate Solution — 0.1 N.

A-5.1.8 Ferric Ammonium Sulphate Solution — saturated, aqueous, freshly prepared.

A-5.1.9 Standard Potassium Thiocyanate Solution — 0.1 N.

A-5.2 Procedure — Take a composite sample (*see* 7.6.1) obtained by cutting small quantities of fabric from the puttees to weigh 1 g. Extract it with methyl alcohol in soxhlet apparatus.

A-5.2.1 Boil off methyl alcohol and follow the procedure given in B-1.2 to B-1.3.1.1 of IS : 1052-1962†.

*Specification for rectified spirit (*revised*).

†Specification for dieldrin, technical (*revised*).

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AMENDMENT NO. 1 JANUARY 1987

TO

**IS:4053-1967 SPECIFICATION FOR KNITTED PUTTEES,
DYED**

(Page 5, Table 2) - Delete entry at Sl No. (iii) and renumber the subsequent entries.

(Page 6; clause 5.1.1) - Add the following new clause after 5.1.1 and renumber the subsequent clauses:

'6. PRESERVATION

6.1 The puttees shall be preserved with the heavy dose of naphthalene, using a minimum quantity of five kilograms per cubic metre of the volume of the bale.'

(Page 10, clause A-5) - Delete.

(TDC 15)